

STS-104 Flight Readiness Review (FRR) Minutes

The STS-104 FRR convened at 10:30 a.m. on Thursday, June 28, 2001, in the Mission Briefing Room, at the Kennedy Space Center (KSC). The meeting was chaired by R. Estess, Space Shuttle Program Lead Center Acting Director.

Flight Crew, Ferry Readiness, Range, and DDMS did not have any issues or constraints to flight and did not make formal presentations. Readiness statements submitted were included in the backup package.

The STS-104 FRR presenters were:

Mission Summary - P. Hill (NASA/JSC/DA8)
Program Integration - N. Hardee (NASA/JSC/MA2), B. White (USA/JSC/USH-C)
International Space Station -
 H. Brasseaux (NASA/JSC/OC)
 S. Gahring (NASA/JSC/OB)
 T. May (NASA/MSFC/FD25)
 B. Eliason (NASA/JSC/OB)
 C. Vaughan (Boeing/Houston/HS2-10)
 C. Hatfield (NASA/JSC/OM7)
 C. Lorenz (CSA/Quebec/J3Y-8YP)
 B. Richard (Boeing/Houston/HM6-20)
 R. Swaim (Boeing/Houston/HM4-30)
Payload Processing - S. Higginbotham (NASA/KSC/UB-1)
External Tank - G. Wadge (LMSSC/MAF/MO), M. Quiggle (LMSSC/MAF/D-3000)
RSRM - S. Graves (Thiokol/Utah/TI-L50)
SRB - R. Elliott (USA/KSC/USK-417)
SSME - G. Hopson (NASA/MSFC/MP21), D. Adamski (Rocketdyne/Canoga Park/55-AB88), J. Price (Pratt & Whitney/West Palm/704-31)
Vehicle Engineering - M. Burghardt (USA/JSC/USH-601M), S. McClung (NASA/JSC/MV6), T. Hinkle (NASA/JSC/EP5), P. Shack (NASA/JSC/EA42)
EVA - S. Broussard (Hamilton Sundstrand/JSC/XA-HAM)
Shuttle Processing - M. Leinbach (NASA/KSC/PH)
Mission Operations - R. Castle (NASA/JSC/DA8), T. Sobchak (NASA/GSFC/451), R. Gest (USA/Houston/USH-402C), P. Hill (NASA/JSC/DA8)
Space and Life Sciences - C. Fischer (NASA/JSC/SA)
SR&QA - M. Erminger (NASA/JSC/MQ).

Mission Summary

This mission is 7A in the International Space Station (ISS) assembly sequence. It involves the transfer of critical ISS crew consumables, Joint Airlock delivery and checkout, and installation of high pressure gas tanks.

Program Integration

This is the first Space Shuttle Main Engine (SSME) Block II flight, which will be in position 2 of the SSME configuration. With completion of open work Space Shuttle Program Integration is ready for flight.

International Space Station (ISS)

The Vehicle Office presented the following four technical issues: the Major Constituent Analyzer Operations, the Carbon Dioxide Removal Assembly, the Beta Gimbal Assembly Rotation High Current and the Node 1 Starboard Common Birthing Mechanism Foreign Object Debris. These technical issues have been assessed and

are acceptable for flight. There were three special topics: the High Pressure Gas Tank Paint Peeling, 7A Extravehicular Activity/Plasma Control Plan, and the Airlock Sample Port. Rationale for flight was presented.

Program Integration presented the Canadarm2 readiness overview including the grapple fixture stiction, Canadarm2 redundant string anomalies, software utilization plan, mission success protection and forward work. Two special topics were presented. The first topic was the Space Station Remote Manipulator System anomaly resolution and Canadian Space Agency status and the second topic was the Canadarm2 loads during common berthing mechanism capture. These topics are not a constraint for flight.

Command and Data Handling presented one special topic on Command and Control Computer Hard Disk Failure Anomaly resolution. Rationale for flight was presented. Communication and Tracking presented three special topics. The first topic was the Ku Band Pointing, the second topic was the Ku Band Antenna Gimbal Temperatures and the third topic was the Medium Rate Communications Outage Recorder. These topics are acceptable for flight.

The ISS Program is ready to proceed with the launch of ISS 7A/STS-104.

Payload Processing

Payloads presented one special topic on IMAX Cargo Bay Camera – 3 Dimensional Cable Damage. Flight rationale was presented. Payload is ready to proceed with the launch of ISS 7A/STS-104.

External Tank (ET)

A processing anomaly and one special topic were presented. The anomaly was the Liquid oxygen tank Dome Weld Repair. Rationale for acceptance was presented. The special topic was cracks in ET-117 barrel panel ribs. This was concluded to be an isolated event and not the result of a systemic problem. ET is ready for STS-104 flight pending completion of open and planned work.

Reusable Solid Rocket Motor (RSRM)

Two approved changes since the previous flight were presented. The first change was due to the Block II SSME Loads Environments – Generic Maximum Allowable Ground Winds. The second was the Nozzle-to-Case Joint Assembly Process Enhancements. Two special topics were presented, the first topic was suspect rubber patterns labels in RSRM internal insulation and the second topic was pocket/wash erosion on throat and forward exit cone. Flight rationale was presented for both these topics. RSRM hardware is ready to support flight for mission STS-104.

Solid Rocket Booster (SRB)

There was one technical issue presented on the Booster Separation Motor Residual Propellant. Rationale for flight was presented. Pending completion of open work Booster Assembly hardware is ready to support the launch of STS-104.

Space Shuttle Main Engine (SSME)

The SSME Engine comparison between the Block I, Block IIA and Block II was presented. Also presented was a Block II overview. This will be the first flight using the Harness Protective Overmolds. Three special topics were presented. The first topic was the Pneumatic Control Assembly Disengaged Nut, the second topic was the Pressure Sensor EB Weld Mistracking and the third topic was the E0525 Contamination/Nozzle Tube Ruptures. Rationale for flight was presented for all these topics. Main Engines are ready for STS-104.

Vehicle Engineering

The following five modifications are flying for the first time: 1) Freon Loop #2 Relief Line Reroute, 2) Lightweight Locker Upgrades, 3) Redundant Drag Chute Reefing Actuation Lanyard, 4) Multifunction Electronic Display System Cooling Vent and 5) ISS Waste Control System. There were six special topics presented. The first topic was the Main Propulsion System (MPS) Feedline Support Fasteners; the second topic was the Thermal Protection System Drying/Rewaterproofing; the third topic was the Orbiter Maneuvering System Pod Vibration; the fourth topic was the Radiator Isolation Valve Circuit Breakers; the fifth topic was the MPS/ Power Reactant Storage and Distribution Cryo Skid Test Stand and the last topic was the Aft Load Control Assembly Power Connector Lugs. All these topics are acceptable for flight.

Government Furnished Equipment presented two topics. The first topic was the Orbiter Docking System Mechanism Fixer #1 failed to engage and the second topic was the NASA Standard Initiator Weld Washer Contamination. Flight rationale was presented for these topics.

One special topic was presented (the FLU-9 Water Activated Pyro Failure). This pyrotechnic device is installed on the life raft. One of these units fired improperly and two others fired inadvertently. A decision will be made on July 2, 2001 to fly the units as is or change them out. A Certification of Flight Readiness exception was issued to certify these devices are safe to fly or appropriate waiver rationale, this will be presented at the STS-104 Pre-Launch Mission Management Team Review.

Pending completion of open work, the Orbiter vehicle, support hardware, flight crew equipment and software are ready to support the launch of STS-104.

Extravehicular Activity (EVA)

EVA presented two previous flight anomalies; the first anomaly was the EVA crewmember eye irritation and the second anomaly was the Extravehicular Mobility Unit (EMU) boot pressure point. Both of these anomalies have been evaluated and dispositioned for flight.

There were four special topics presented: 1) Exercise Prebreathe Protocol, 2) Bends Treatment Adapter, 3) Space Station Remote Manipulator System (SSRMS) Workarounds and 4) ISS Airlock User Interface Assembly to EMU Oxygen Temperature. These topics have no constraints for launch.

EVA Project Office is ready to proceed with STS-104/7A Launch.

Shuttle Processing

Pending completion of planned, open work and resolution of any identified constraints, Kennedy Space Center Shuttle Processing and Supporting Organizations are ready to support Launch Operations for STS-104.

Mission Operations

The following STS-104/7A Significant Flight Rules will be presented at the July 5, 2001 Program Requirements Change Board; Payload Bay Control Bus In-Flight Maintenance, Redundant Power/Avionics for Common Berthing Mechanism (CBM) and SSRMS, Shuttle Launch Window, Shuttle EVA rules updated, SSRMS loads capabilities, Airlock and High Pressure Gas Tank (HPGT) thermal constraints and contingency response and Redundancy requirements for SSRMS and CBM operations.

There were five special topics presented. The first topic was the Dependencies on Command and Data Handling System, the second topic was the Airlock Unberth/Install

Summary, the third topic was the HPGT Unberth/Handoff Summary, the forth topic was the Operational Readiness to Reduce Risk to SSRMS Failures and the fifth topic was the Airlock Go/No Go.

Mission Operations is ready to support the launch of STS-104/7A.

Space and Life Sciences

Space and Life Sciences presented one special topic on the ISS 7A Cycle Ergometer Vibration Isolation System Check Out Procedure.

Space and Life Sciences Directorate is ready to support STS-104/7A.

Safety, Reliability and Quality Assurance

With the satisfactory completion of identified open work, Safety and Mission Assurance has no constraints to STS-104/7A.

Action Items/Exceptions

There were no action items assigned. One exception was submitted.

Mr. Estess polled the principal managers and organizations; all responded that they were prepared to support the STS-104 mission.



James D. Halsell, Jr.
Colonel, USAF
Manager, Launch Integration

Enclosures:

Agenda

Exception Log

STS-104
Flight Readiness Review
June 28, 2001

Agenda

Introduction	Manager, Launch Integration
Mission Summary	Flight Director, Mission Operations
Program Integration	Flight Manager Manager, Space Shuttle KSC Integration Manager, Space Shuttle Systems Integration Manager, Space Shuttle Customer and Flight Integration APM, Program Integration, SFOC
International Space Station	Manager, International Space Station Program
Payload Processing	Director of ISS/Payloads Processing
External Tank	Manager, External Tank Project
RSRM	Manager, Reusable Solid Rocket Motor Project
SRB	Manager, Solid Rocket Booster Project APM, SRB Element, SFOC
SSME	Manager, Space Shuttle Main Engine Project
Vehicle Engineering	Manager, Space Shuttle Vehicle Engineering APM, Orbiter Element, SFOC APM, Flight Software, SFOC APM, FCE/EVA, SFOC
EVA	Manager, EVA Project
Shuttle Processing	Director of Shuttle Processing APM, Ground Operations, SFOC APM, Integrated Logistics, SFOC
Mission Operations	Director, Mission Operations APM, Flight Operations, SFOC
Flight Crew	Director, Flight Crew Operations
Space and Life Sciences	Director, Space and Life Sciences
Ferry Readiness	Ferry Operations Manager
Range	United States Air Force
DDMS	Director, DDMS
SR&QA	Manager, Safety, Reliability and Quality Assurance
Exception/Action Summaries	Manager, Launch Integration
Readiness Poll	Lead Center Director for Space Shuttle and Space Station Programs

CoFR EXCEPTION LOG

CoFR REVIEW DATE: 06-28-01 STS FLT NO. STS-104				DUE DATE		STS-104 PMMT REVIEW			
REQUIREMENT/ EXCEPTION NUMBER		ELEMENT		DESCRIPTION OF EXCEPTION					
001		ORBITER		NSTS 08117 PARAGRAPH 8.5.1.1 CREW ESCAPE EQUIPMENT FAILURES - LIFE RAFT WATER ACTIVATED PYROTECHNIC DEVICE FAILURES AT THE VENDOR ARE UNDER INVESTIGATION. ONE UNIT FIRED IMPROPERLY AND FAILED TO PUNCTURE CO2 BOTTLE, AND TWO UNITS FIRED INADVERTANTLY.					